CLAIMS

What is claimed is:

1. A method of determining an optimal therapeutic stimulus (pulsewidth, amplitude), for stimulating nerve with at least one electrode (17), the method comprising:

(a) providing a predetermined calibration curve defined by sets of paired parameter values (pulsewidth, amplitude);

(b) determining an optimal pulsewidth value, P1, by presenting sets of paired parameter values (pulsewidth, amplitude) that are part of the calibration curve, until a threshold stimulus parameter pair (P1, A1) is found which elicits a threshold or a just noticeable response in a patient; and

(c) determining an maximum comfortable amplitude value, A2, by holding constant the pulsewidth, P1, found in the preceding step.

2. The method of claim 1, wherein the threshold stimulus (P1, A1) is measured by a sensing instrument.

3. The method of claim 2, wherein the sensing instrument is selected from the group consisting of a plethysmograph, an accelerometer and a transducer for detecting evoked potentials.

4. The method of claim 1, further comprising:

(d) determining the therapeutic value, A3, by holding pulsewidth, P1, found in step(b) constant, and setting A3 equal to A2,

wherein step (c) is accomplished by incrementally increasing stimulus amplitude until the maximum comfortable threshold amplitude, A2, is found, while holding the pulsewidth, P1, found in step (b) constant.

5. The method of claim 1, further comprising:

(d) determining the therapeutic value, A3, by holding pulsewidth, P1, found in step(b) constant, and setting A3 value less than A2,

wherein step (c) is accomplished by incrementally increasing stimulus amplitude until the maximum comfortable threshold amplitude, A2, is found, while holding the pulsewidth, P1, found in step (b) constant.

6. The method of claim 1, wherein the calibration curve has an elbow occurring at a pulsewidth value of between about 100 to 300 microseconds.

7. The method of claim 1, wherein step (c) for determining A2 is accomplished by multiplying the amplitude A1 found in step (b) by a multiplicative factor.

8. The method of claim 7, wherein the multiplicative factor is about 1.4.

9. The method of claim 1, wherein the calibration curve is derived based on pre-measurement of maximum electrode impedance setting and ensuring that maximum comfortable threshold voltage is well below system compliance voltage.

10. The method of claim 1, wherein the calibration curve is derived based on minimizing current drain, in accordance with the relation:

$$P_{drain} = \{ (I_{stim} * Pulsewidth_{stim} * Rate_{stim})^2 * Z_{combination} \} + P_{sys} .$$

11. The method of claim 1, wherein the calibration curve provides a UR that is sufficiently wide to provide stimulation to yield both a perception threshold and a maximum comfortable threshold.

12. The method of claim 1, wherein the step (b) of determining (P1, A1) is performed using a software program to present the various parameter values (pulsewidth, amplitude) in accordance with the predetermined calibration curve.

13. The method of claim 1, wherein the at least one electrode (17) chosen presents the highest impedance among possible available electrodes.

14. A method of determining optimal stimulus pulsewidth and amplitude for stimulating nerves with at least one electrode (17), the method comprising:

(a) providing a predetermined calibration curve comprising a set of pulsewidth (70) and amplitude values; and

(b) selecting a stimulus pulsewidth (70) and an amplitude which provides a maximum comfortable threshold by delivering stimuli to the at least one electrode (17), the stimuli chosen from pulsewidth and amplitude parameter pairs which are part of the calibration curve.

15. The method of claim 14, wherein the calibration curve is derived based on pre-measurement of maximum electrode impedance setting and ensuring that the maximum threshold is well below the system compliance voltage.

16. The method of claim 14, wherein the calibration curve is derived based on minimizing current drain, in accordance with the relation:

$$P_{drain} = \{ (I_{stim} * Pulsewidth_{stim} * Rate_{stim})^2 * Z_{combination} \} + P_{sys} .$$

17. The method of claim 14, wherein the calibration curve provides a UR that is sufficiently wide to provide stimulation to yield both a perception threshold and a maximum threshold.

18. The method of claim 14, wherein the at least one electrode (17) chosen presents the highest impedance among possible available electrodes.

19. The method of claim 14, wherein in step (b) delivering stimuli to the at least one electrode (17), stimuli chosen from pulsewidth and amplitude parameter pairs which are part of the calibration curve is performed by using a software program.